Wisconsin's Commercial Trawl Harvest 2000

Steve Surendonk
Wisconsin DNR, Mishicot Field Station

INTRODUCTION

Wisconsin's commercial fishing industry typically utilizes three types of gear on Lake Michigan: gill net, entrapping nets and trawler. This report focuses on the commercial trawling industry and utilizes the harvest information submitted by the commercial fisherman for rainbow smelt *Osmerus mordax,* bloater chub *Coregonus hoyi and* alewife *Alosa pseudohargus*.

Historically, commercial trawling has targeted three main species of fish in the Wisconsin waters of Lake Michigan. Much of the harvest was a general forage catch that was utilized by the pet food market. This type of trawling caught large numbers of fish, chiefly alewife, rainbow smelt, and bloater chub. The catch from 1983 to 1990 ranged from 9,547,528 to 25,757,452 pounds and was dominated by alewife (Peeters 1991). The other portion of the trawl fishery was a targeted rainbow smelt harvest used for the human food market. The targeted harvest of rainbow smelt peaked in 1990 at 1,834,014 pounds, and has since declined.

During 1991 additional rules regulating trawling in the waters of Lake Michigan and Green Bay were adopted. These rules were designed to allow the harvest of rainbow smelt, eliminate general forage catches and established a Total Allowable Commercial Harvest (TACH) for rainbow smelt. The regulations also restricted the areas, dates, and times fished to establish a daylight, deep water (depths greater than 60 feet) Lake Michigan fishery from November 15 to April 20, and a nighttime, deep water (depths greater than 65 feet) Green Bay fishery from June 15 to September 30 (Figure 1). The (TACH) for rainbow smelt, effective license year 2000 is 1 million pounds annually, of which no more than 351,993 pounds can be caught in Green Bay.

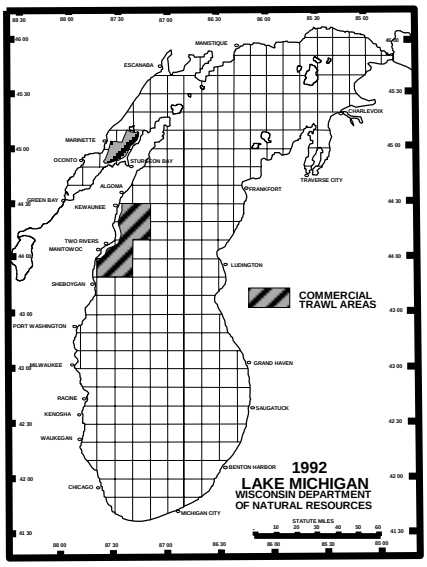

Figure 1. Permitted commercial trawling grounds.

This report builds on earlier reports from Peeters (1989, 1991, and 1992) and Surendonk (1993, 1996, 1997, 1998 and 1999). Further, it summarizes trawl harvest from Lake Michigan and Green Bay for calendar year 2000 and license year 2001 as described in Wisconsin Administrative Code N.R. 25.9 (2)(d).

METHODS AND RESULTS

Trawl harvest information was obtained from the mandatory biweekly catch forms submitted by commercial license holders during the statutory season. This report examines reported harvest data two ways, on a calendar year and licenses year basis. Calendar year harvest is reported for historical comparison and license year harvest is presented to examine quota harvest since new rule changes were established in license year 1992.

Unsorted catch harvest, as defined in this report, includes incidentally caught fish which were landed and not discarded offshore as dead scrap or reported as processed bloater chub. Incidental (unsorted) catch is mostly bloater chub but also includes other species not limited to alewife and unmarketable smelt.

Calendar Year 2000
(January 1,2000- December 31,2000)

In calendar year 2000, trawlers reported harvesting a combined total of 297,671 pounds of rainbow smelt from Lake Michigan and Green Bay (Figure 2, Appendix 1). The total rainbow smelt harvest in 2000 was 65 percent below the 1999 calendar year harvest.

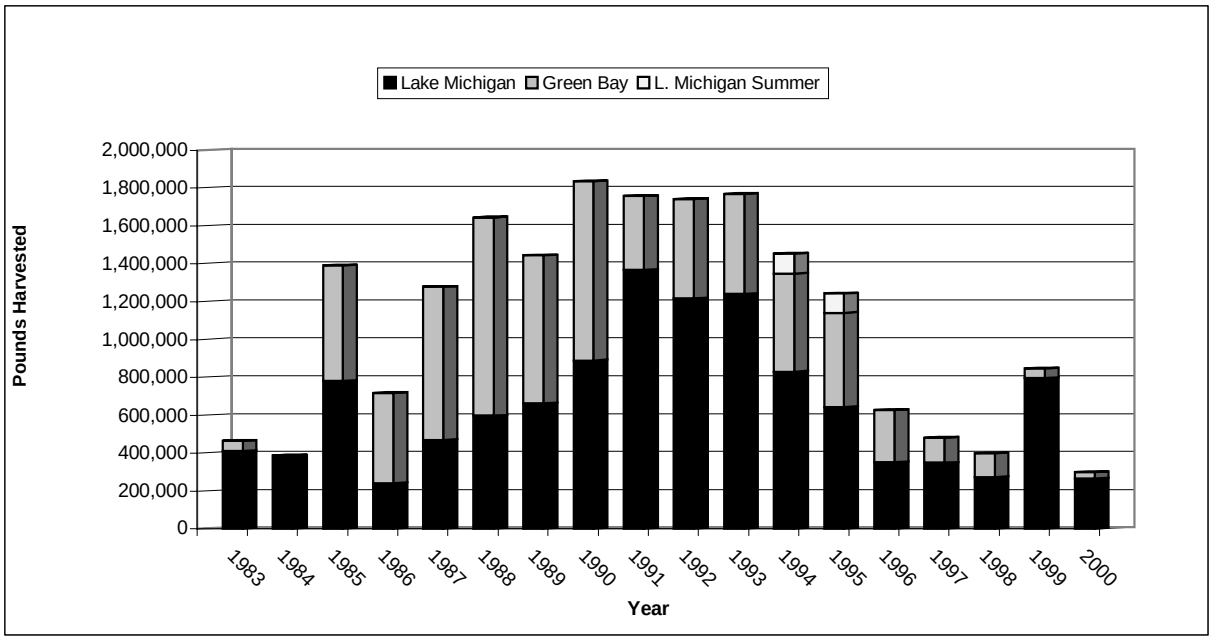

Figure 2. Calendar year reported harvest of rainbow smelt from Lake Michigan and Green Bay from 1983 through 2000 by commercial trawl.

Lake Michigan

The 2000 calendar year rainbow smelt harvest from Lake Michigan was 263,800 pounds. Trawlers fished for 1,305 hours with a catch per effort (CPE) of 202 pounds per hour trawled (Figure 3, Appendix 1). The Lake Michigan harvest was 67 percent lower than the 1999 harvest and CPE decreased 53 percent from 1999 levels.

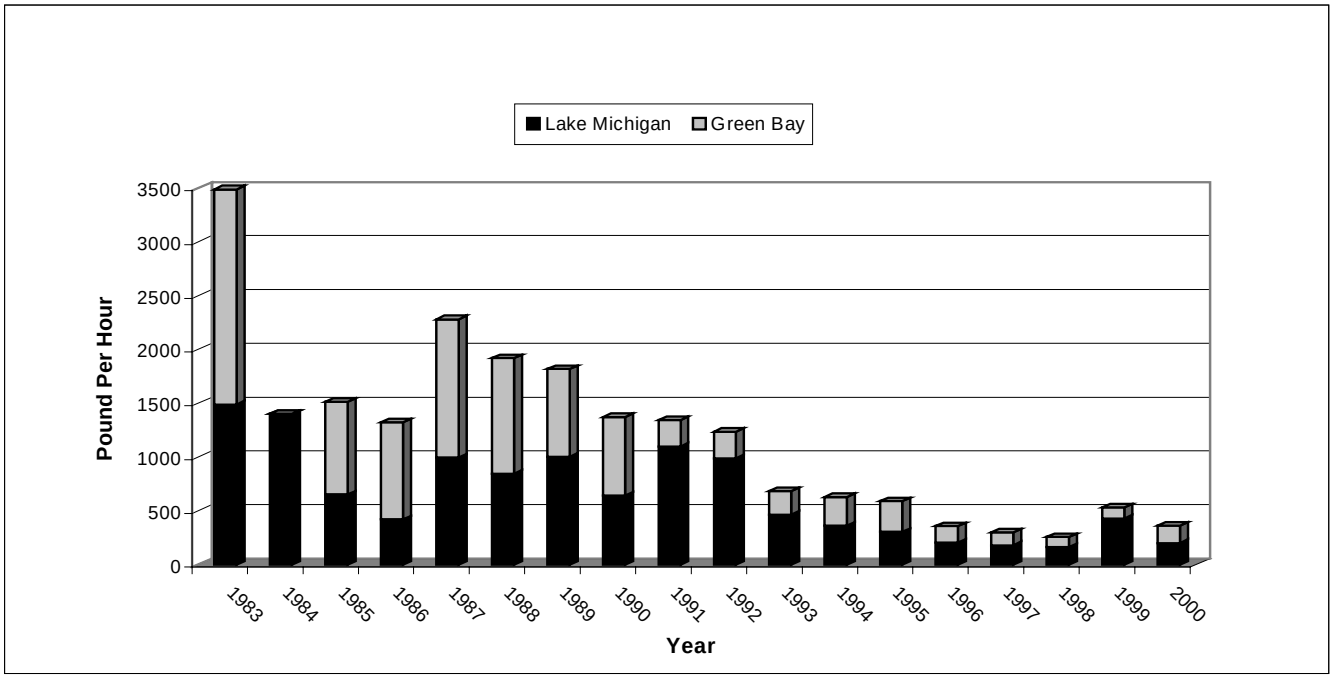

Figure 3. Calendar year reported catch per effort of rainbow smelt, by commercial trawl, from Lake Michigan and Green Bay from 1983 through 2000.

Additionally, the trawlers reported harvesting 12,486 pounds of bloater chub which were processed for their flesh or roe; 973 pounds of bloater chub roe or unprocessed roe and 266,786 pounds of unsorted catch consisting mainly of bloater chub, alewife and unmarketable rainbow smelt.

Green Bay

On Green Bay, trawlers reported harvesting 33,871 pounds of rainbow smelt during calendar year 2000. Trawlers fished for 211 hours with a CPE of 161 pounds per hour trawled during calendar year 2000 (Figure 3, Appendix 1). The Green Bay harvest was 33 percent lower than the 1999 harvest and CPE increased 35 percent from the 1999 level.

Additionally, trawlers reported harvesting 1,236 pounds of unsorted catch.

License Year 2001
(July 1,2000 - June 30,2001)

In license year 2001, trawlers harvested a combined total of 268,095 pounds of rainbow smelt from Lake Michigan and Green Bay (Figure 6, Appendix 2). License year 2001 harvest decreased 12 percent from the 2000 harvest and was 86 percent lower than the 1992 license year harvest, the first license year affected by the quota system.

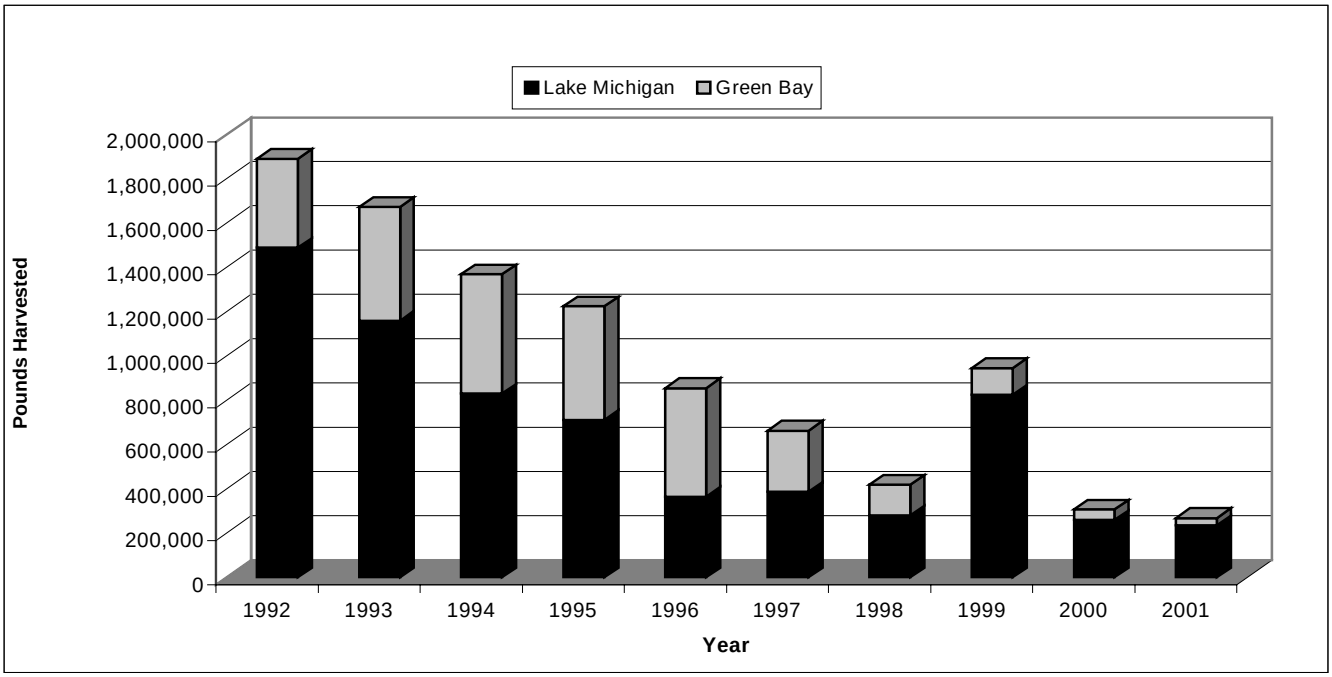

Figure 6. License year reported harvest of rainbow smelt from Lake Michigan and Green Bay from 1992 through 2001 by commercial trawl.

Lake Michigan

The 2001 license year rainbow smelt harvest from Lake Michigan was 234,380 pounds. Trawlers fished for 1,843 hours with a CPE of 127 pounds per hour trawled (Figure 7 Appendix 2). The 2001 harvest was 9 percent lower than the 2000 harvest and 84 percent lower than the 1992 license year harvest. While hours trawled have increased 34 percent from 2000 they have increased 27 percent from the 1992 license year. The CPE has decreased 40 percent from 2000 levels and decreased 89 percent from the 1992 license year.

Additionally, the trawlers reported harvesting 45,894 pounds of bloater chub which were processed for their flesh or roe; 5,400 pounds of bloater chub roe or unprocessed roe and 233,451 pounds of unsorted catch consisting mainly of bloater chub, alewife and unmarketable rainbow smelt.

Green Bay

The 2001 license year rainbow smelt harvest from Green Bay was 33,715 pounds. Trawlers fished for 206 hours with a CPE of 164 pounds per hour trawled (Figure 7 and Appendix 2). The license year harvest was 30 percent lower than the 2000 harvest and 92 percent lower than the 1992 harvest. Hours trawled have decreased 55 percent from 2000 and have decreased 88 percent overall from the 1992 license year. CPE has increased 36 percent from the 2000 level but have decreased 32 percent from the 1992 license year.

Additionally, trawlers reported harvesting 1,197 pounds of unsorted catch.

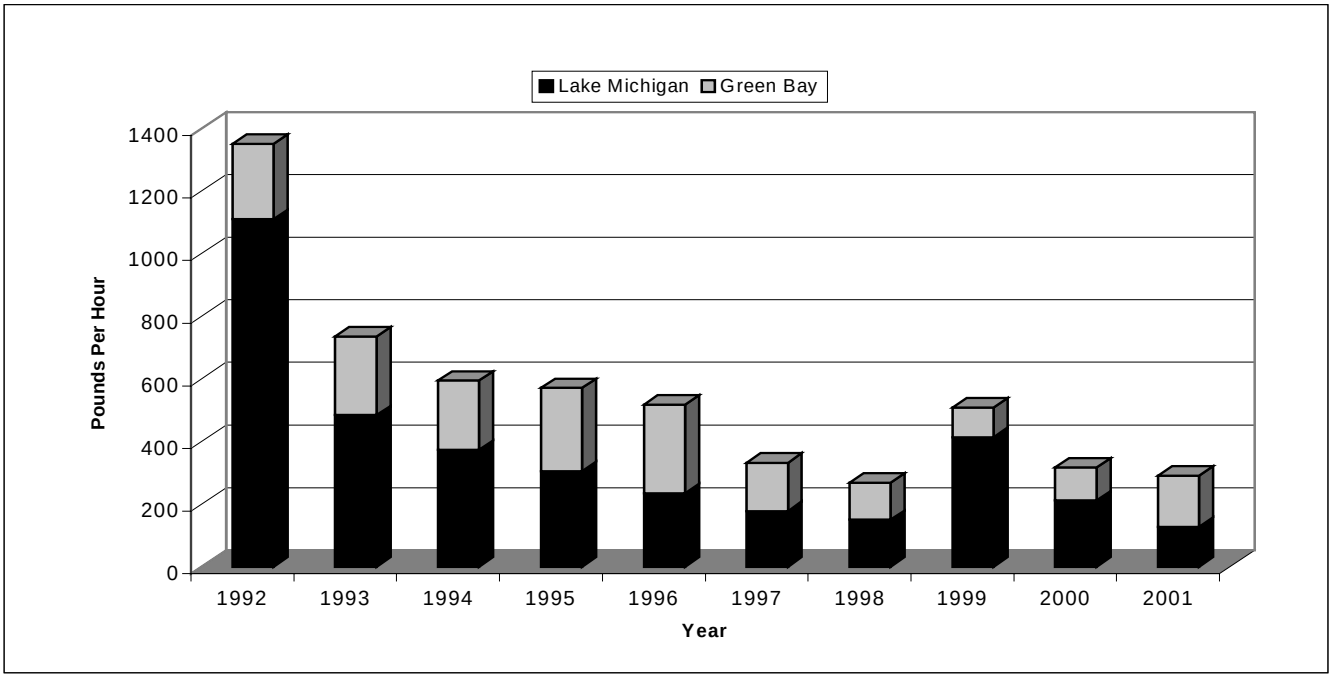

Figure 7. License year reported catch per effort of rainbow smelt by commercial trawl, from Lake Michigan and Green Bay from 1992 through 2001.

DISCUSSION

Reported harvest figures used throughout this report were obtained from commercial catch reports submitted by commercial fisherman. Frequently all that is reported is the poundage of saleable rainbow smelt sorted from the catch for human consumption. At times, the incidental catch of rainbow smelt too small for the human consumption market can be substantial. Peeters (1991) indicated the discrepancy between monitored and reported CPE might be the result of sorting for marketable fish with the remainder being reported as unsorted catch or returned dead to the water as scrap.

The declines in harvest and CPE appear to be independent of the regulatory changes enacted in 1992, and may be an indicator of an overall lakewide decline in rainbow smelt stock. Data collected by the Department of the Interior, U.S. Geological Survey Biological Resource Division (USGS) indicates that relative abundance and biomass of rainbow smelt (available to bottom trawl) has declined from 1992 levels (Fleisher et al 2000). The USGS data indicates a 76 percent decline in biomass of rainbow smelt between the years of 1992 and 1999 (Figure 8).

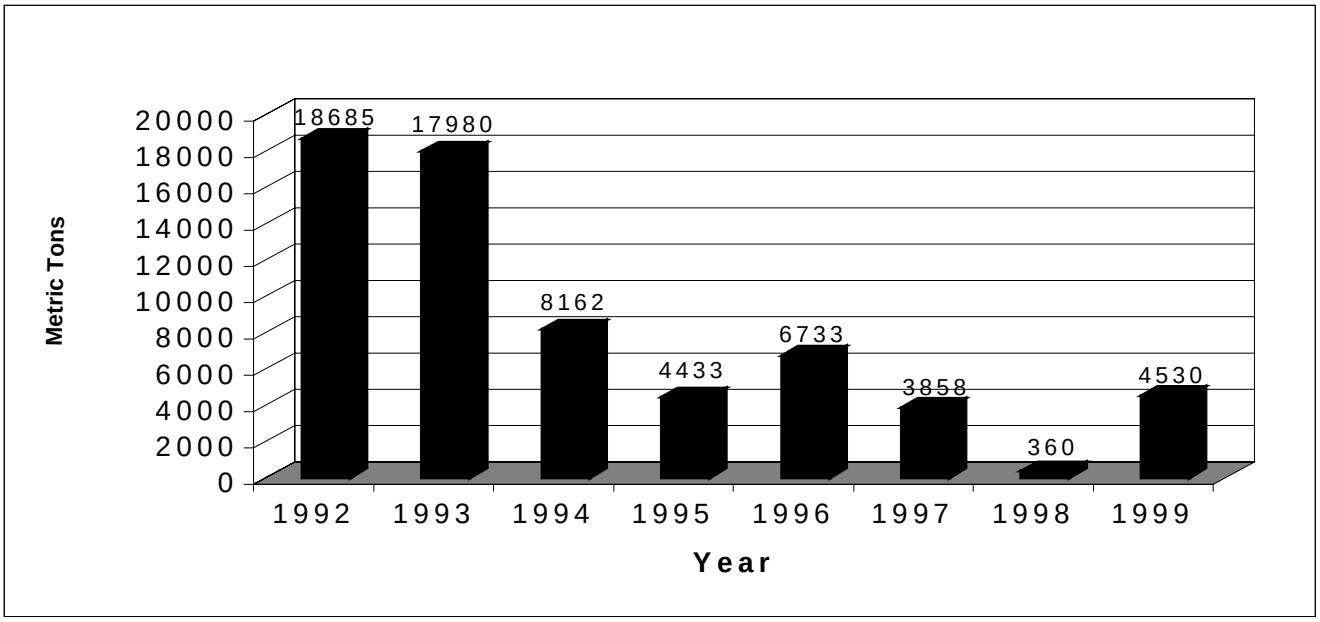

Figure 8. United States Geological Survey estimated biomass of rainbow smelt in Lake Michigan 1992-1999, based on bottom trawl survey.

Sampling difficulties prevented development of a lake-wide biomass estimate for 2000. However, relative abundance expressed as Catch Per Unit Effort was found to have declined from 83 fish per tow in 1999 to 67 fish per tow in 2000(Fleisher et al 2001). Generally, the harvest of rainbow smelt by commercial trawlers is similar to population trends determined by U.S.G.S. index trawling.

Lake Michigan smelt stocks showed no sign of rebound in the commercial trawl industry in license year 2001. Total harvest declined to a 9 year low of 234,380 pounds of smelt, a 67 percent decline off the 9 year average of 700,029 pounds. The industry fished for 1,843 hours in license year 2001 an increase of 629 hours over license year 2000 but near the 9 year average of 1,898 hours trawled.

If smelt relative abundance is expressed in terms of Catch Per Hour of Trawl, license year 2001 was the lowest reported smelt abundance in 9 license years. The commercial trawl industry reported harvesting 127 pounds per hour in license year 2001, a 67

percent decline off the 9 year average of 385 pounds per hour trawl.

On Lake Michigan the trawling industry utilized 5 vessels in license year 2001. During this license year a new vessel the Peter Paul(formally the Art Swaer) reentered the fishery and the vessel Avis J didn't trawl. (Figure 9, appendix 3).

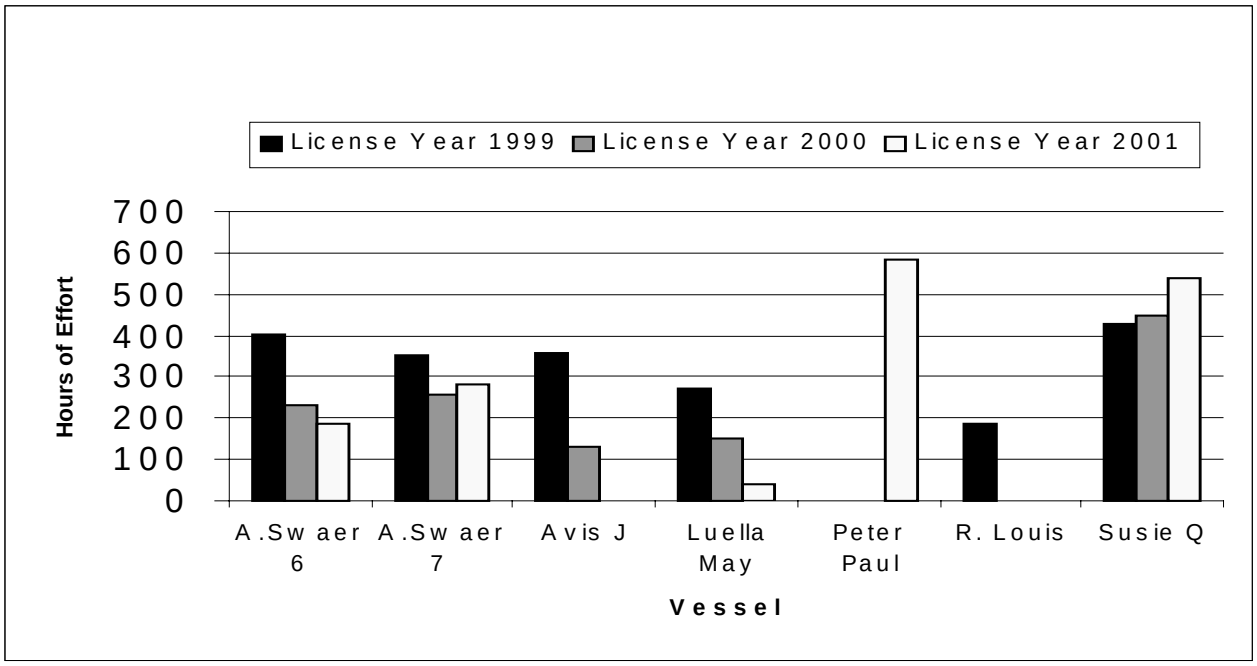

Figure 9. Reported effort by vessel on Lake Michigan, license year 1999 -2001.

The status of the Green Bay smelt stock is unclear. If smelt relative abundance were an expression of Catch Per Unit of Effort (CPE), license year 2000 and 2001 would suggest that the stock maybe rebounding with gains in CPE both years. However, it is likely that this data is misleading due to low trawling effort and small sample size. The commercial trawl industry reported harvesting 164 pounds per hour of trawl in license year 2001, 15 percent below the 9 year average of 193 pounds per hour trawl.

Total harvest declined to a 9 year low of 33,715 pounds of smelt which is a 90 percent decline below the 9 year average of 338,066 pound. The industry fished for 206 hours in license year 2001 a decrease of 253 hours from license year 2000 and 1406 hours below the 9 year average of 1,612 hours trawled.

On Green Bay the trawling industry utilized 3 vessels in license year 2001 and the vessel Susie Q chose not to trawl (Figure 10, appendix 3).

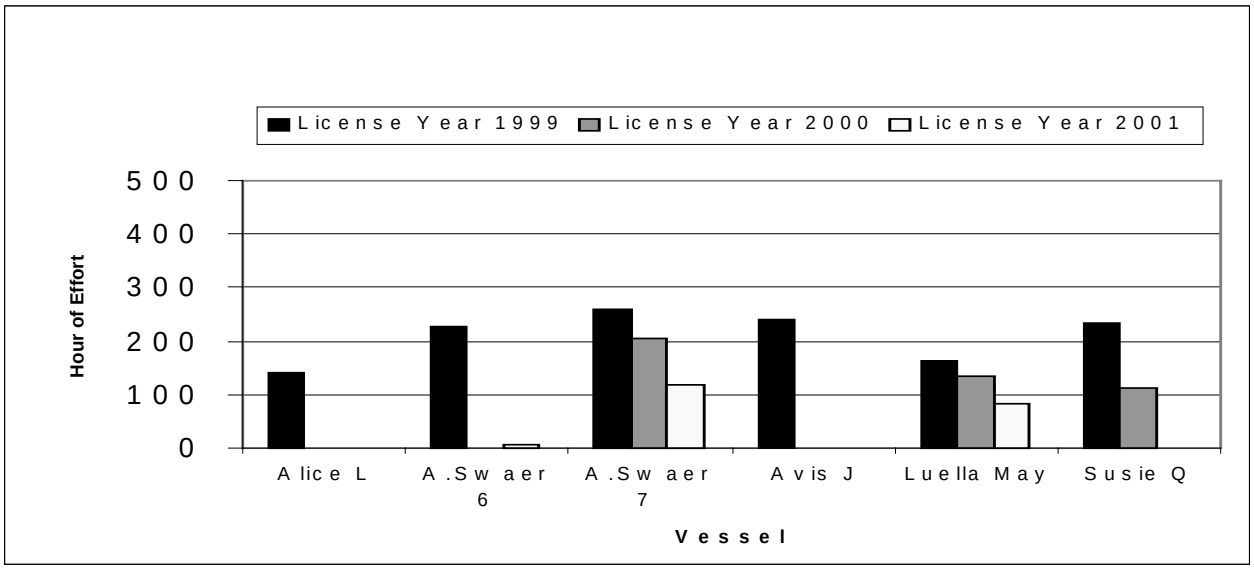

Figure 10. Reported effort by vessel on Green Bay, license year 1999 -2001.

In license year 2001 trawling effort remained consistent until season closure on April 20th. This continuous effort maybe a reflection of the demand for bloater chub flesh and roe and the relatively high market prices for these products. The decreased interest in trawling during the summer months on Green Bay maybe due to low smelt abundance, marginal market prices and the absence of marketable bicatch (Figure 11, appendix 4).

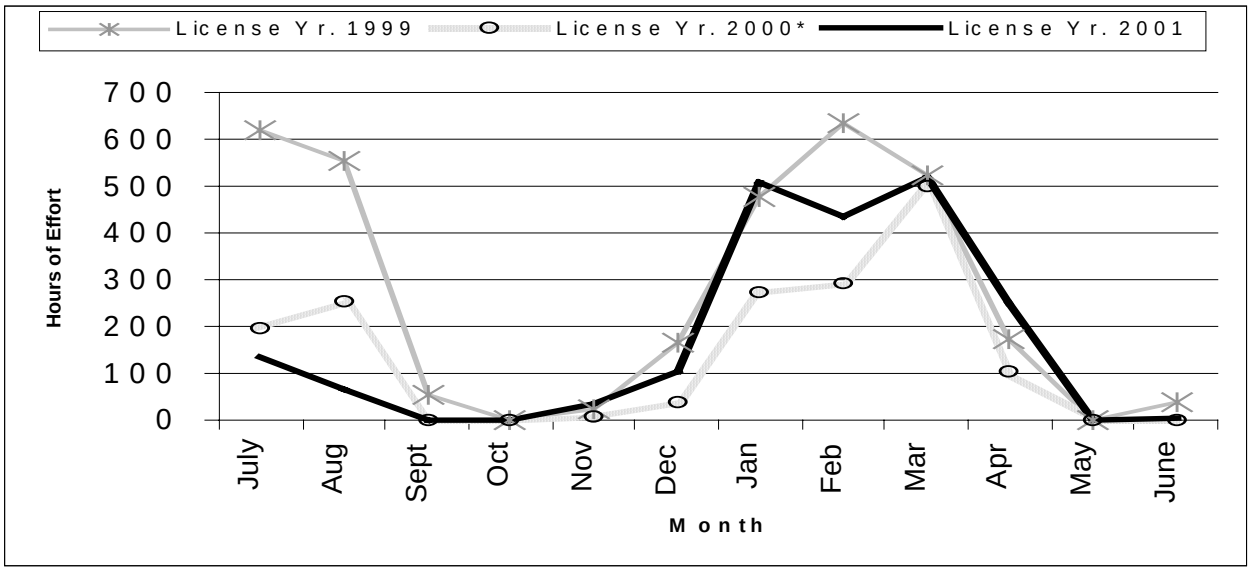

Figure 11. Reported effort by month on Green Bay and Lake Michigan, license year 1999 -2001.

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Appendix 1. Reported rainbow smelt harvest and CPE for commercial trawling on Lake Michigan and Green Bay for calendar years 1983 through 2000.

Calendar Year*	Lake Michigan Harvest (lbs.)	CPE**	Green Bay Harvest (lbs.)	CPE**	Summer Study Harvest (lbs.)	Total Harvest (lbs.)
1983	408,928	1,489	54,990	2,000		463,918
1984	385,704	1,401	0	0		385,704
1985	779,618	654	609,454	860		1,389,072
1986	239,340	422	476,732	901		716,072
1987	467,245	996	808,775	1,284		1,276,020
1988	596,112	845	1,046,045	1,072		1,642,157
1989	660,890	1,004	781,171	814		1,442,061
1990	887,765	641	946,249	732		1,834,014
1991	1,366,419	1,099	389,440	246		1,755,859
1992	1,215,253	988	524,856	248		1,740,109
1993	1,237,106	465	529,560	220		1,766,666
1994	828,396	363	518,096	266	104,366	1,450,858
1995	642,324	304	496,744	284	101,716	1,240,784
1996	349,900	205	276,454	154		626,354
1997	347,696	180	131,229	121		478,925
1998	272,075	161	125,396	94		397,471
1999	794,151	429	50,588	104		844,739
2000	263,800	202	33,871	161		297,671

*Calendar year runs from January 1 through December 31 of the same year.
**CPE is reported as pounds/hour trawled.

Appendix 2. Reported smelt harvest, CPE, and effort for commercial rainbow smelt trawling on Lake Michigan and Green Bay for license years 1992 through 2001.

License Year*	Lake Michigan Harvest (lbs.)	CPE**	Effort (hrs)	Green Bay Harvest (lbs.)	CPE**	Effort (hrs)	Total Harvest (lbs.)***
1992	1,488,460	1,110	1,341	401,768	241	1,669	1,890,228
1993	1,158,984	484	2,395	512,788	251	2,041	1,671,772
1994	829,724	373	2,223	538,859	222	2,430	1,386,115
1995	710,510	305	2,330	513,894	266	1,929	1,353,592
1996	363,592	235	1,548	491,417	283	1,735	914,371
1997	386,521	178	2,168	276,431	154	1,800	662,952
1998	280,281	150	1,867	138,256	119	1,158	418,537
1999	824,286	414	1,992	120,843	94	1,291	945,129
2000	257,905	212	1,214	48,336	105	459	306,241
2001	234,380	127	1,843	33,715	164	206	268,095

*License year runs form July 1 through June 30 of the following year.
**CPE was calculated as pounds/hour trawled and does not include harvest and effort data from the Lake Michigan Summer Study 1994 and 1995.
***Total Harvest does not include harvest from the Lake Michigan Summer Study 1994-1995.

Appendix 3. Reported commercial smelt trawl effort by vessel on Lake Michigan and Green Bay, License Year 1999-2001.

	Lake Michigan hours of effort by License Year			Green Bay hours of effort by License Year		
	1999	2000	2001	1999	2000	2001
Alice L				142	0	
A.Swaer 6	401	233	186	228	0	5
A.Swaer 7	351	255	280	260	215	119
Avis J	357	129	0	241	0	
Luella May	270	149	40	163	134	82
Peter Paul			583			
R. Louis	185	0	222	0	0	
Susie Q	430	449	537	235	111	

Appendix 4. Hours of effort by month for Lake Michigan and Green Bay for license year 1999-2001.

Month	Lake Michigan and Green Bay reported effort for License Year 1999.	Lake Michigan and Green Bay reported effort for License Year 2000.	Lake Michigan and Green Bay reported effort for License Year 2001.
July	620	196	134
August	555	254	67
September	55	0	0
October	Season Closed	Season Closed	Season Closed
November	24	7	33
December	164	39	104
January	477	273	509
February	633	292	434
March	523	499	518
April	173	105	248
May	Season Closed	Season Closed	Season Closed
June	39	10	5